PG DMLT Semester II

Subject Name: Standard Practices in Biomedical Laboratory (SPB)

Subject Code: 02ML0202

Objective: To provide deep insights to students regarding the standard practices employed in a biomedical laboratory.

Credits Earned: 4 Credits

Course Outcomes: After the completion of the course:

1. Students will become aware about various clinical procedures in medical microbiology.
2. Students will learn about ethical and standard practices in a biomedical laboratory.
3. Students will gain deep insights regarding the handling and treatment of biomedical waste.
4. Students will become well versed with the advanced serological and molecular diagnostic techniques.

Pre-requisite of course: Basic awareness of Good Lab Practices (GLP).

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Practical/ TW	
4	0	0	4	50	30	20	0	0	100

Contents:

Unit	Topics	Contact Hours
1	**Basics of Medical Microbiology** Sterilization & disinfection.BiosafetyCollection, handling& transportation of various clinical specimens.Various staining methods in medical microbiology.Composition &preparation of media, methods of isolation & identification of bacterial pathogens.Anaerobiosis.Infection control, hospital acquired infections.Immunity & Vaccination. Resistance mechanisms: AMR, ESBL, MRSA, MDR.	15
2	**Ethical, Standard Practices& Accreditation** Ethical Principles and standards for a clinical laboratory professional duty to the patient, duty to colleagues and other professionals. Preparation of Standard operating protocols and document management.Ethics in Medical laboratory Practice, Ethics in relation to Pre-Examination procedures, Examination procedures, reporting of results, preserving medical records. ***Good Laboratory Practice (GLP)***: Introduction to Basics of GLP and accreditation, aims of GLP. ***Accreditation:*** advantages of accreditation, Brief knowledge about National and International Agencies for clinical laboratory accreditation(NABL, ISO, NABH, AABB).	10
3	**Biomedical Waste (BMW) Management** Present Scenario of Biomedical waste: concepts and perceptions, waste generation, segregation, disposal. Planning and objectives of BMW management, survey, policies and perspectives of BMW Management.Record keeping, management of bio-medical waste.Technologies for treatment for BMW, criteria for selecting appropriate medical waste technologies. Legal aspects and environment concern, Implementation of action plan, approaches to common regional facility.	15
4	**Serology & Molecular Diagnostics** Serological Tests for microbial infections, antigen and antibody tests - Agglutination, Immunodiffusion, Counter-Immunoelectrophoresis, Complement fixative test, Immunofluorescence, Radioimmunoassay (RIA) Test, ELISA.Molecular Diagnostics using various Polymerase Chain Reaction (PCR) Techniques: Reverse Transcription PCR, Nested PCR, Real-Time PCR.	20
	Total Hours	**60**

References:

1. The Book of Hospital Waste Management: Dr. D.B. Acharya &Dr.Meeta Singh (Minerva Press, New Delhi)
2. Hospital Waste Management & its Monitoring: Madhuri Sharma (Jaypee Brothers, Medical Publishers (P) Ltd. New Delhi)
3. Teitz (2007), Fundamentals of Clinical Chemistry, 6th edition, Elsevier Publications
4. Bishop (2013), Clinical Chemistry, 7th edition, Wiley Publications
5. Henry's Clinical Diagnosis and Management by Laboratory Methods. (2011), 22nd edition, Elsevier

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
25%	25%	25%	15%	10%	0%

Instructional Method:

a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, etc.

b. The internal evaluation will be done on the basis of continuous evaluation of students in the classroom in the form of attendance, assignments, verbal interactions etc.

c. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.